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Groups of countries in special situations: follow-up to the Fourth United Nations Conference on the Least Developed Countries

Feasibility study for a United Nations technology bank for the least developed countries

Report of the Secretary-General

Summary

The present report is submitted pursuant to General Assembly resolution 68/224, in which the Assembly requested the Secretary-General to transmit the report and the recommendations of a high-level panel of experts on a technology bank for the least developed countries to the Assembly at its sixty-ninth session for its consideration, with a view to operationalizing such a bank during its seventieth session, if so recommended by the panel; and pursuant to Economic and Social Council resolution 2014/29, in which the Council recalled that request.

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I. Background

1. The Programme of Action for the Least Developed Countries for the Decade 2011-2020 (Istanbul Programme of Action) and the Istanbul Declaration, which were adopted in 2011 by the Fourth United Nations Conference on the Least Developed Countries, called for undertaking on a priority basis by 2013 a joint gap and capacity analysis with the aim of establishing a technology bank and a science, technology and innovation supporting mechanism dedicated to least developed countries. In that connection, the Conference welcomed the generous offer of the Government of Turkey to host an international science, technology and innovation centre.

2. The General Assembly, in paragraph 21 of its resolution 67/220, requested the Secretary-General to take the steps necessary to undertake a joint gap and capacity analysis on a priority basis by 2013, with the aim of establishing a technology bank and science, technology and innovation supporting mechanism dedicated to the least developed countries, building on existing international initiatives.

3. Accordingly, the Secretary-General prepared a report in which he confirmed that the current state of science, technology and innovation in the least developed countries remained poor (A/68/217). More notably, the least developed countries remained well behind other developing countries in terms of the share of science, technology and innovation expenditure as a portion of gross domestic product (GDP), annual filings of patent applications and the number of articles in peer-reviewed journals.

4. Following its consideration of that report, the General Assembly, in paragraph 25 of its resolution 68/224, noted with appreciation the offer of Turkey to host a technology bank and science, technology and innovation supporting mechanism dedicated to the least developed countries under the auspices of the United Nations, and in that regard requested the Secretary-General, on the basis of voluntary contributions, to constitute a high-level panel of experts drawn from the least developed countries and their development partners, the United Nations system and other relevant stakeholders to carry out a feasibility study, with secretariat support provided, within existing resources, by the Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States, in order to examine its scope, functions, institutional linkage with the United Nations and organizational aspects. The Assembly also requested the Secretary-General to transmit the report and the recommendations of the high-level panel to the Assembly at its sixty-ninth session for its consideration, with a view to operationalizing a technology bank during its seventieth session, if so recommended by the panel.

II. Introduction

5. As requested by the General Assembly, on 26 November 2014 the Secretary-General established the High-level Panel on Technology Bank for Least Developed Countries to study the scope and functions of the proposed technology bank dedicated to helping the world's least developed countries to lift themselves out of poverty.

6. The General Assembly mandated the High-level Panel to examine the scope, functions, institutional linkage with the United Nations and organizational aspects of the technology bank, including by:

(a) Assessing the ability of a technology bank to promote scientific research and innovation and facilitate the diffusion and transfer of technologies to the least developed countries, on voluntary and mutually agreed terms and conditions, and with necessary protections for intellectual property;

(b) Considering the current international institutional landscape, synergies and options for cooperation with relevant international technology initiatives, stakeholders and organizations, both within and outside the United Nations system, and the need to avoid duplication of efforts;

(c) Examining and outlining potential functions, activities, working methods, governance mechanisms, staffing arrangements and costs for a technology bank and science, technology and innovation supporting mechanism, including possible regional centres in the least developed countries;

(d) Examining options for facilitating the necessary voluntary financial support to a technology bank for its establishment and effective and sustained functioning.

7. The Panel held two meetings in Turkey, the first one in Gebze on 16 and 17 February 2015, and the second in Istanbul on 2, 3 and 4 September 2015, hosted by the Scientific and Technological Research Council of Turkey. The Office of the High Representative provided secretariat and substantive support to the Panel in the preparation of the feasibility study.

III. Key findings of the High-level Panel

8. In its feasibility study, the High-level Panel called for the establishment of a technology bank in order to ensure focused and sustained collaboration for the promotion of science and technology in the least developed countries and the transfer and diffusion of technology and to ensure the institutionalization and coherence of global support and cooperation. Given that the technology bank would be a new institution, the Panel recommended that its activities be developed over time on the basis of the experience and expertise gained through an initial set of activities. The experience accumulated in the implementation of those activities would be crucial. Accordingly, the Panel proposed activities for an initial start-up phase that would span four years.

9. The Panel envisaged that the activities of the initial phase would respond to the immediate needs of the least developed countries and serve as an opportunity to demonstrate to them the benefits of its efforts to improve their capacities in the areas of science, technology and innovation, including through the adoption of a more systematic approach in those areas and the diffusion and transfer of technology. The initial phase would facilitate the consolidation of the financial base of the technology bank and the building of partnerships with stakeholders in the least developed countries and other developing and developed countries.

10. The Panel proposed that, at the conclusion of the initial phase, an assessment be carried out, which would serve as a basis for consolidating the activities

conducted during the first phase. It would also consider the expansion of those activities through greater country coverage and the initiation of new activities. The Panel recommended that the technology bank adopt a multi-stakeholder approach in its work and that it leverage North-South, South-South and triangular cooperation arrangements in the design and delivery of its activities. In addition to providing support to individual least developed countries through country-led activities, it would make use of regional, subregional and interregional approaches to the development of science, technology and innovation.

11. The Panel underlined that although the technology bank would be dedicated to technology transfer and to the promotion of science, technology and innovation in the least developed countries, least developed countries that graduated from that category should also be able to gain access to its services on a case-by-case basis to ensure that their progress was not abruptly disrupted.

12. The Panel rightly recommended that mainstreaming women and youth into the work of the technology bank be a high priority. The nexus of youth, entrepreneurship and high-technology fields is pervasive in the developed world. Most global efforts to engage youth have focused on more advanced, emerging-market countries, but there are some programmes that benefit youth and women in the least developed countries. The technology bank, in its initial phase, should build on such initiatives.

13. The Panel emphasized the importance of the involvement of organizations of the United Nations system that had already been carrying out activities in the science, technology and innovation arena. The technology bank would leverage the existing initiatives of United Nations agencies, funds and programmes at the regional and national levels in implementing its programme of work. An ad hoc Inter-Agency Task Team, led by the Office of the High Representative, was established in 2012 to contribute to the work of the Panel.[1] Such an inter-agency mechanism would support the work of the technology bank.

14. The Panel recommended that the activities undertaken by the technology bank be aligned and coherent with national development priorities and consistent with common country programming principles. To that end, initiatives undertaken by the technology bank, in partnerships with relevant United Nations agencies, funds and programmes, would be integrated with the United Nations Development Assistance Framework in consultation with United Nations country teams and other relevant stakeholders.

15. While undertaking a thorough review of the status of the least developed countries, the Panel found that the state of science, technology and innovation in the least developed countries remained poor. Disparities between the least developed countries and the rest of the world in the capacity to generate and apply science and technology knowledge have been growing. While members of the Organization for Economic Cooperation and Development spent, on average, 2.4 per cent of GDP on

[1] The members of the ad hoc Inter-Agency Task Team are the following: the World Intellectual Property Organization, the World Trade Organization, the United Nations Conference on Trade and Development, the International Telecommunication Union, the United Nations Industrial Development Organization, the United Nations Educational, Scientific and Cultural Organization, the World Bank, the United Nations Entity for Gender Equality and the Empowerment of Women, the Economic Commission for Africa and the Economic and Social Commission for Asia and the Pacific.

research and development in 2013, the amount dedicated to research and development in the least developed countries for which data are available was negligible.[2]

16. The Panel found that limited resources, including a narrow base of scientific literacy, had contributed to the scant generation, diffusion and application of scientific knowledge in the least developed countries. Similarly, the limited research and development capabilities in those countries had rendered them dependent on the acquisition of new technologies from abroad.

17. The Panel noted that there were many provisions governing the transfer of technology in international agreements, conventions and protocols. However, existing arrangements and mechanisms for such transfer had not enabled the least developed countries in a meaningful way to overcome their severe weakness in the areas of science, technology and innovation and to build a technological base. Various studies have suggested that the existing mechanisms for technology transfer are fragmented and often ad hoc in terms of objective content and country coverage. No existing global framework, agreement or mechanism is comprehensive enough to advance capacity-building in science, technology and innovation in the least developed countries.

18. The Panel determined that substantial investments of time, effort and funds were required to build the capacity for the indigenous development of science, technology and innovation and to integrate that capacity into productive activities that would drive greater and more rapid economic growth. Building a research institution that meets international standards would require long-term investments over a decade and a half or more.

19. The Panel recommended that, during that period, considerable effort be put into attracting human resources of the highest quality, building cutting-edge facilities, procuring essential equipment, developing relationships with universities, firms and markets globally and securing online connectivity to ensure that researchers could readily interact with their global peers and access current online publications. That developmental model, of course, assumes the existence of institutional capacity and funding commensurate with the achievement of such an ambitious goal.

20. According to the study, the developing countries direct around 1 per cent of the total official development assistance (ODA) received to science, technology and innovation, while the least developed countries direct merely 0.5 per cent of their total ODA to those areas. Second, the total bilateral aid for science, technology and innovation given to the least developed countries amounts to about 15 per cent of the aid for science, technology and innovation given to all developing countries. Third, the categories of science, technology and innovation in both the developing and the least developed countries that receive the greatest amount of ODA are agricultural research, followed by medical research, scientific institutions and environmental research. Technological research and development account, on average, for merely 3 per cent of the total ODA spent on science, technology and innovation in both the developing and the least developed countries.

[2] For example, Burkina Faso spent 0.20 per cent of GDP on research and development in 2009; Ethiopia, 0.24 per cent in 2010; the Gambia, 0.133 per cent in 2011; Lesotho, 0.013 per cent in 2011; Madagascar, 0.106 per cent in 2011; and Uganda, 0.56 per cent in 2010.

21. In its feasibility study, the Panel provided a brief account of the current landscape of technology-related initiatives within the United Nations system in support of the least developed countries and identified a variety of technology-related initiatives at the global and regional levels. A number of United Nations entities, including the World Intellectual Property Organization (WIPO), the World Trade Organization (WTO), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations Industrial Development Organization, the International Telecommunication Union, the United Nations Conference on Trade and Development (UNCTAD), the World Bank, the Food and Agricultural Organization of the United Nations, the United Nations Environment Programme, the Climate Technology Centre and Network and the World Health Organization (WHO), as well as the regional commissions and the South-South Global Assets and Technology Exchange system, have been supporting important programmes and initiatives to promote science, technology and innovation capacity in the least developed countries. Since the adoption of the Istanbul Programme of Action, the Office of the High Representative has been constantly engaged in promoting the agenda of the technology bank for the least developed countries, according to its mandate. It has provided secretariat and substantive support to the Panel and established the ad hoc Inter-Agency Task Team on the technology bank to ensure system-wide coordination in its establishment. The Panel observed that many international agreements, conventions and protocols included provisions governing the transfer of technology.

22. On the basis of an analysis of the existing measures undertaken by the entities of the United Nations system, the Panel indicated that those measures included support for national science, technology and innovation policy frameworks, the analysis of information and communications technology (ICT) trends and policy review, the provision of access to scientific and technical information, support for integration into global intellectual property and innovation databases, the stocktaking of technology transfer measures, technical support for building human and institutional capacity through training and workshops, technical assistance for the transfer of climate technologies and matchmaking in technology transfer among developing countries.

23. The Panel was of the view that the initiatives and measures undertaken by United Nations system organizations to facilitate technology transfer were geared towards providing benefits to developing countries and the least developed countries. However, given their very limited absorptive capacities, it is very difficult for the least developed countries to benefit from multiple facilities. Instead, they need an easily accessible and coordinated one-stop arrangement. The technology bank could meet that goal by working closely with United Nations system entities and other stakeholders to build synergy, coherence and collaboration in order to provide dedicated support and coordination for technology transfer and science, technology and innovation capacity-building in the least developed countries.

24. On the basis of careful analysis, the Panel concluded that the technology bank would be both feasible and desirable, with its expected benefits far outstripping the cost of its operations. The Panel determined that the thinking behind the technology bank was sound and that the planning already carried out suggested that it could be launched on a firm foundation. It could become an important instrument for ensuring that the least developed countries were no longer left behind in the

achievement of internationally agreed development goals, especially the Sustainable Development Goals.

25. The Panel recommended that the technology bank build on the wide range of existing and planned programmes and initiatives to help the least developed countries to articulate their science, technology and innovation policies and priorities as part of their overall development strategies and to assist them in building their capacities in those areas. The bank would help to develop the domestic capacity of the least developed countries to absorb patented intellectual property. It would also act as a conduit between the holders of intellectual property rights in developed countries and relevant actors in the least developed countries, helping to create new opportunities for the dissemination, diffusion and adaptation of key technologies.

26. The Panel proposed that the technology bank be composed of two interrelated organizational units: a science, technology and innovation supporting mechanism and an intellectual property bank.

27. The overarching objective of the supporting mechanism would be to help the least developed countries to strengthen their national science, technology and innovation capacities, which are essential for the development, acquisition, adaptation and absorption of technologies for sustainable development. Development-driven science, technology and innovation necessarily entail directed policies to create domestic innovation ecosystems that can attract outside technology and generate home-grown research and take it to market. According to the Panel, the mechanism would foster knowledge networks and worldwide partnerships between researchers, innovators and entrepreneurs in the least developed countries and their global peers.

28. The overarching objective of the intellectual property bank would be to help to build the national intellectual property capacity of the least developed countries and to facilitate technology transfers on voluntary and mutually agreed terms and conditions and, in the process, accelerate the beneficial integration of the least developed countries into the global intellectual property system. To that end, among other functions, it would assist in the realization of the promise of technology transfer under the 1994 Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS).[3]

29. The Panel argued that, from the perspective of the least developed countries, the intellectual property bank would add value as a one-stop shop for coordinated support for national intellectual property capacity-building and the facilitation of technology transfer. From the perspective of the developed countries, the bank could also serve as a focal point to help the least developed countries communicate and work with the outside world effectively, assisting them in their communications and

[3] The term "technology transfer" conveys two very different, widely used and easily confused meanings. In Western universities and research institutions, it describes the process for facilitating the commercial application of applied science, or "lab-to-market", as with an engineering school's business incubator. In the current context, it refers to the transmittal of advanced technical knowledge from developed countries to the developing world. Article 66.2 of the Agreement on Trade-Related Aspects of Intellectual Property Rights states: "Developed country Members shall provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least-developed country Members in order to enable them to create a sound and viable technological base."

their requests for technical assistance and financial cooperation. The Panel stated that the bank would facilitate a win-win dialogue and the allocation of resources for the use of intellectual property as a tool for development and would act to instil in participating least developed countries the capacity to benefit from technology transfer and diffusion.

30. The Panel recommended that, in the initial phase, the supporting mechanism consist of two subprogrammes: digital research access and networking and science, technology and innovation policy and capacity-building support.

31. The digital research access and networking subprogramme would have two components: the digital access for research transfer and transformation programme and the national research and education network facilitation programme.

32. The Panel found that the least developed countries had the greatest need for, and confronted the highest barriers to access to, relevant science, technology and medical information, and it underlined their need for easy access to available scientific research and knowledge materials. The Panel recommended that the digital access for research transfer and transformation programme foster knowledge networks and worldwide partnerships between researchers, innovators and entrepreneurs in the least developed countries and their global peers.

33. The Panel recommended that the digital access for research transfer and transformation programme build synergy and partnerships with such existing mechanisms as Research4Life, an innovative public-private partnership among WHO, FAO, UNEP, WIPO, the International Association of Scientific, Technical and Medical Publishers, Microsoft Corporation and more than 160 global publishers of online scientific, medical and technical publications that provides developing countries with free or low-cost access to academic and professional peer-reviewed content online. In 2001, WHO negotiated agreements with the six largest global publishers of online medical journals, encouraging other partners and publishing houses to join the initiative.

34. The Panel recommended that the digital access for research transfer and transformation programme adopt a phased approach, beginning with Bangladesh, Mozambique, Nepal, Senegal, Uganda and the United Republic of Tanzania, all countries in which Research4Life has particularly strong local champions. Those initial focal points could act as mentors as more country focal points are added, eventually becoming regional and/or subject/language specialized hubs for South-South support for other least developed countries. The Panel also recommended that special emphasis be placed on francophone and lusophone regions, in which many least developed countries are located and which, Research4Life recognizes, have been underserved.[4]

35. The Panel also recommended that in-country focal points help researchers in the least developed countries to learn how to use publishing house libraries for knowledge-gathering and ensure that their own scholarly writings (and, eventually,

[4] English is the lingua franca of global science journals, but Research4Life offers access to many journals in other languages.

patent applications) comprehensively cited other research.[5] The supporting mechanism could also offer guidance on writing for peer-reviewed science and engineering journals.

36. The Panel underscored that, if scientists in the least developed countries were to actively participate in and benefit from the technology bank, they would need affordable access to data communications infrastructure nationally, regionally and globally. Today, when technological innovation at all levels of society is driven by access to data communications, the least developed countries that have general Internet penetration of less than 50 per cent of their population are losing out daily. They are the world's "digital have-nots". Governments and international organizations need to recognize that data communications infrastructure is no longer something that is merely nice to have, but is an absolute necessity for the development of any country.

37. The results of the feasibility study illustrate that, as the scientific community pushes the boundaries of knowledge, researchers are relying on dedicated data communications networks to provide greater speed, timely delivery, seamless global reach and a very high level of resilience. The Panel recommended that the technology bank be able to deliver immediate data communications connectivity to the scientists it was intended to reach.

38. With a view to extending such facilities to the least developed countries in a cost-effective manner and as early as possible, the Panel recommended that the technology bank build partnerships with national research and education networks. These are high-speed data communications networks that are independent of the commercial Internet and dedicated to meeting the needs of the academic and research communities. Such networks, which have been developed in 100 countries, including 16 least developed countries, offer direct, dedicated data communications infrastructure on a national scale, with regional and global interconnections. The infrastructure of such networks allows researchers, teachers and students to share information electronically in a reliable and timely fashion and to collaborate effectively across the globe. The Panel stated that, by building on such infrastructure, the bank would be able to deliver immediate data communications connectivity to scientists.

39. According to the Panel, the basis for the science, technology and innovation policy and capacity-building programme is the fact that virtually every least developed country possesses world-class scientists and technologists, but usually too few to enable them to coalesce around a common discipline. The contemporary challenges confronted by the least developed countries, including climate change, environmental challenges, food insecurity, water scarcity and public health, energy, communications, transport and logistics issues, are typically multisectoral and do not lend themselves to solutions from a single area of knowledge. Thus, a fundamental objective of the programme would be to help craft so-called

[5] A hallmark of peer-reviewed journal articles is that they are replete with citations of related research, a precondition to claiming that their own contributions are seminal. Without such citations, authors from the least developed countries cannot garner credibility, however original their insight or discoveries might be.

collaborative innovation networks[6] that would enable scientists and technologists in the least developed countries to connect and collaborate with their global peers.

40. The Panel recommended that, in the initial stage, the science, technology and innovation policy and capacity-building programme commence by creatively building on existing initiatives, especially those undertaken by Member States, United Nations system organizations, academia and non-governmental and non-profit entities.

41. The Panel indicated that, in order to formulate an appropriate assistance programme, the science, technology and innovation policy and capacity-building programme would require baseline reviews for every least developed country. Rapidly developing national strategy papers or building on existing ones should be an immediate priority for the supporting mechanism. That effort would start with a group of pilot countries, in partnership with UNCTAD and UNESCO,[7] building on the well-regarded science, technology and innovation policy reviews of those organizations. An integral part of the process of preparing the strategy papers would be to organize national stakeholder conferences with a view to maximizing the engagement and contribution of the relevant actors and, thereby, genuine national ownership.

42. The Panel recommended that the first order of business for the science, technology and innovation policy and capacity-building programme be the establishment of collaborative linkages to pertinent institutional actors. Establishing such linkages necessitates determining what assistance is available, how each least developed country has set its science, technology and innovation priorities and how best to facilitate the requisite connections with potential partners. In that regard, the programme would play a comprehensive and active liaison role.

43. The Panel was of the view that, since a good number of science academies now existed in the least developed countries in Africa, the science, technology and innovation policy and capacity-building programme could help to promote the ability of those academies to advise Governments on development strategies. To that end, the Panel recommended that the technology bank work with such entities as the InterAcademy Partnership, a global consortium of science academies, based at the World Academy of Sciences, in Trieste, Italy.

44. The Panel also proposed that the science, technology and innovation policy and capacity-building programme engage in liaison with the InterAcademy Partnership to see what might be done to increase the number and influence of science academies in other least developed countries. Both Haiti and the least developed countries of South-East Asia lack an academy. The least developed countries in the Pacific Ocean present a special challenge; they could forge a regional academy, as has been done in the Caribbean. Collaboration could be set up between the programme and the InterAcademy Partnership to that end. It would be useful to promote and strengthen regional networks of science academies. The number of young science academies is rising, and there should be strong linkages between them and the senior academies. In addition, the science academies in the least developed countries need to play a role in national development policies.

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[6] The term "collaborative innovation networks" was coined by the Global Knowledge Initiative on the basis of its research, which was funded by the World Bank and the Rockefeller Foundation.

[7] Since neither UNCTAD nor UNESCO has sufficient funding to assume the extra financial burden, the technology bank will need to raise funds.

45. The Panel made recommendations with respect to science, technology and innovation capacity-building for tertiary-level institutions. A number of institutions in the least developed countries have already benefited from the African Regional Initiative in Science and Education, funded by the Carnegie Corporation of New York.[8] The donor horizon should be actively scanned to ensure that pertinent institutions in the least developed countries are considered for inclusion in such initiatives, helping donors and potential recipients to identify synergistic linkages.

46. The Panel was of the view that most scientists in the least developed countries could benefit from the type of training on how to master the grant-writing and application process that their peers in developed countries received.[9] Such training might become, in time, a valuable service that the science, technology and innovation policy and capacity-building programme could provide. In the initial phase, an online training module could be developed and delivered to researchers in the least developed countries, in close cooperation with relevant organizations.

47. The Panel also indicated that, in coordination with Research4Life document searches, the science, technology and innovation policy and capacity-building programme could help researchers in the least developed countries to find like-minded collaborators and, by extension, co-authors when they sought to publish their own research findings. Guidance on writing for peer-reviewed science and engineering journals could also be arranged through the programme, delivered in partnership with such organizations as AuthorAID, which was launched in 2013 as a subset of the International Network for the Availability of Scientific Publications, a non-governmental organization based in the United Kingdom of Great Britain and Northern Ireland, to help scientists in the developing world publish articles in science and technology journals.[10]

48. The Panel recommended that, in conjunction with the intellectual property bank, the science, technology and innovation policy and capacity-building programme provide advice to authors in the least developed countries on when and how to file for a patent prior to the public disclosure of their research findings. Traditional intellectual property training would include the training of academic innovators on why they should file for protection and how to do so. The least

[8] Beneficiaries in the least developed countries include Eduardo Mondlane University (Mozambique); Makerere University (Uganda); Sokoine University of Agriculture (United Republic of Tanzania); the Tea Research Foundation of Central Africa (Malawi); University of Dar es Salaam; University of Malawi; and the Western Indian Ocean Regional Initiative (Tanzania Zanzibar).

[9] Most leading research universities in Europe and North America conduct courses in grant writing for their faculties. Overburdened academics in the least developed countries, even if they learn how, will still be challenged to find time for the grant-application process. The science, technology and innovation supporting mechanism could help them narrow the search for promising or overlooked funding streams, and arrange for their applications to be critiqued before submission.

[10] The International Network for the Availability of Scientific Publications also created Africa Journals Online, based in South Africa, in 1997 to publicize the research of African academics. While not confined to science, engineering or medicine, those disciplines dominate its publishing field. The funding for Africa Journals Online comes primarily from the Department for International Development of the Government of the United Kingdom of Great Britain and Northern Ireland and the Norwegian Agency for Development Cooperation, with additional support from the Ford Foundation and the Danish Ministry of Foreign Affairs. AuthorAID is currently funded by the United Kingdom and Sweden.

developed countries are very rich in traditional knowledge and could enjoy the benefits of geographical indications of many products. The technology bank could support them in reaping the benefits of those resources.

49. The Panel argued that the science, technology and innovation policy and capacity-building programme should be able to advise and, if necessary, provide negotiating support to participating institutions in the least developed countries, which generally lacked sufficient legal resources, before they entered into collaborative research with other institutions.[11] The programme should provide that service from the outset, given its fundamental objective of creating regional and global partnerships that lend themselves to online delivery. The digital access for research transfer and transformation programme and Research4Life will also have the opportunity to work with publishers to gain access to their extensive collections of expired and current patents, patent applications and patent search tools and to provide training for stakeholders to facilitate more robust knowledge transfer.

50. The Panel recommended that the science, technology and innovation policy and capacity-building programme alert would-be authors about the unfortunate rise in fraudulent online science and technology journals that solicited contributions from unsuspecting scholars, especially those in the developing world. Obviously, any journal associated with Research4Life is legitimate, but it is difficult to be familiar with all of them, especially when they must be accessed through each publisher's website. Acting as a one-stop shop and reference point for country focal points, a science, technology and innovation help desk could act as a filter to verify the legitimacy of a publication.

51. Regarding diaspora outreach, the Panel recommended that a priority action be to determine ways of capturing relevant information.[12] The science, technology and innovation policy and capacity-building programme would collaborate with relevant institutions with a view to establishing a diaspora science, technology and innovation information database, which would serve as the initial step in the creation of a least developed countries diaspora science, technology and innovation network.

52. The study showed that over the past two decades, since the acceptance of the TRIPS Agreement as part of the global intellectual property system, both developed and least developed countries had struggled to use the existing framework of its articles 66.2 (least developed country members) and 67 (technical cooperation) without demonstrable success. The intellectual property bank would endeavour to fill that gap through its initial activities to help the least developed countries help themselves.

53. The Panel indicated that the gap could be bridged through the simple structural solution of enabling the intellectual property bank, as a sophisticated intermediary, to develop capacity in absorption, adaptation and human capital and to promote the formation of innovation and financial ecosystems, technology transfer, foreign

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[11] Virtually every research agreement in the developed world includes an intellectual property annex that governs new findings that might be generated under mutual collaboration. Most researchers do not attempt to understand the complexity of intellectual property rights, however, relying instead on their university or corporate legal departments to safeguard their intellectual property.

[12] The Royal Society, *Knowledge, Networks and Nations: Global Scientific Collaboration in the 21st Century*, p. 107 (London, 2011).

direct investment and science, technology and innovation. In support of those goals, policymakers must bear in mind a number of considerations.

54. The Panel recommended that efforts to transfer technology be supported not only by Governments, but also by public research organizations, individual researchers and the private sector. All are key participants in the technology transfer ecosystem, and the goals surrounding technology transfer must be aligned with their needs.

55. The Panel also recommended that, to facilitate endogenous innovation as well as technology transfer, intellectual property rights be clearly delineated and no unnecessary barriers to the licensing of those rights be imposed. Inappropriate or excessive delays resulting from the process by which technologies are licensed or otherwise made available can impede research partnerships, licensing arrangements and innovation.

56. The Panel was of the view that technology transfer was more than just licensing technology: it was an ongoing exercise that improved the interconnectedness of the innovation system. Thus, a technology-transfer policy should facilitate the rapid private sector adoption of technologies transferred to the least developed countries from abroad, as well as those developed by public research and educational organizations in those countries.[13]

57. The Panel proposed that a key immediate task of the intellectual property bank be to act as a single point of contact representing the interests of the least developed countries and to help to catalyse a sound and viable technology base.

58. The Panel presented the caveat that since the intellectual property bank was expected to grow incrementally and the capacity of the least developed countries was expected to grow accordingly, there were some sophisticated issues that would not be covered in the initial stage, such as engaging in patent pools, standards-essential patents and fair, reasonable and non-discriminatory licensing.

59. The Panel recommended that the intellectual property bank, therefore, develop coherent integrated strategies tailored to the specific needs of each participant in the least developed countries. Those strategies should be geared towards developing a sound and viable knowledge and technology base that would enable at least half of the 48 least developed countries to graduate from that status by 2020 in a manner that would be respectful of existing intellectual property rights and integrative into the existing global intellectual property ecosystem.

60. The Panel recommended that the intellectual property bank assist in facilitating national technology assessments as a distinct part of the science, technology and innovation policy reviews and the requisite economic analyses to be prepared under the supporting mechanism. Key actions in the initial stage would include providing support to the least developed countries through the following actions:

(a) The identification of the core area of focus, including those mentioned during the first meeting of the Panel: public health (life sciences), agriculture, sustainable energy (including solar and biofuels), ICT and the preparation of

[13] Other technology bank activities, including enhanced Research4Life access, improved national research and education network connectivity and robust science, technology and innovation support, should enable scientists and technologists in the least developed countries to generate their own intellectual property over time.

specific proposals for assistance. ODA programmes were already focused on some of those areas;

(b) The identification and phasing-out of obsolete or weak research and development infrastructure. Unlike many other areas of activity, that would require private sector incentives. The intellectual property bank would provide a much-needed platform to coordinate with existing capacity-building programmes to improve access for the least developed countries and to initiate new programmes;

(c) Collaboration with the least developed countries and the existing providers of capacity-building support to ensure that the selection criteria for identifying technologies was directed to maximizing the spillover benefits for the least developed countries. Identified technologies would be voluntarily negotiated and structured, taking into account the benefits for the least developed countries and the need to incentivize the intellectual property owner to transfer the identified technology.

61. The Panel proposed that, in the initial phase, the intellectual property bank also provide expertise in interfacing with donor countries and international organizations to articulate the priority needs of the least developed countries, preparing proposals and communicating with providers of intellectual property-related support through four main activities of the intellectual property bank:

(a) Supporting the identification of the priority needs of the least developed countries;

(b) Providing assistance to the least developed countries with the submission of those needs to the WTO TRIPS Council;

(c) Coordinating with a multitude of existing interested intellectual property technology assistance providers;

(d) Determining those priority needs on the basis of the results from the three initial activities mentioned above;

(e) Assisting the least developed countries with related financial and business functions necessary to develop projects.

62. The Panel recommended that the intellectual property bank coordinate closely with the supporting mechanism and Research4Life to assist researchers and innovators in universities and public entities and technology entrepreneurs in the private sector in the least developed countries in gaining access to information on technology and technical and financial assistance in using such information. The intellectual property bank should:

(a) Provide added value by assisting stakeholders in the least developed countries in gaining access to and using free patent information. That capacity involves search and, when necessary, translation;

(b) Assist the least developed countries in scouting technology, identifying and reviewing the available technical information and identifying patent owners and, more important, companies with commercially available technical solutions;

(c) Establish linkages with national, regional and global intellectual property organizations to enhance communication with and the provision of services to the least developed countries in the initial phase;

(d) Serve as a conduit for connections to existing networks so that research and development can begin to result in new inventions and companies. Other potential partners include accelerators, incubators, science and technology parks, specialized research institutions and other centres of knowledge and excellence and the relevant programmes of such major donor foundations as the Bill and Melinda Gates Foundation;

(e) Use existing knowledge-sharing platforms for initial use including, for example, the Technology Facilitation Mechanism established by the third International Conference on Financing for Development;

(f) Make use of existing partnering mechanisms, especially online portals that provide access to public-private partnership resources;

(g) Coordinate with supporting mechanism activities to conduct education and training for government, the business community, universities and other stakeholders on various forms of intellectual property and the fundamentals of technology transfer.

63. The Panel also recommended that, in the initial phase, the intellectual property bank serve as a coordinated mechanism for information-sharing and for developing and coordinating technical and financial cooperation between the least developed countries and the providers of intellectual property-related capacity-building assistance in the following ways:

(a) Provide technical advice on upgrading existing laws and drafting new laws, strengthening human and institutional capacities and enhancing implementation and enforcement;

(b) Support the modernization of intellectual property administration in terms of digital search, examination, publication and the recording of ownership;

(c) Enhance the institutional infrastructure and triple helix of government-university-industry and overall societal support for the role of science, technology and innovation and intellectual property as tools for economic growth.

64. The Panel was of the view that, in the initial period, extending the activities of the intellectual property bank beyond basic technology transfer support might prove to be too complex and burdensome. That does not mean that the least developed countries will wait indefinitely until the bank develops its own capacity to participate in more complex activities. With that in mind, the bank should initially undertake the following activities:

(a) Develop a programme for attorneys to provide pro bono support for the least developed countries with regard to complex contract negotiations towards obtaining patents and licences. The programme could be modelled on the inventor assistance programme of WIPO and the World Economic Forum. The bank should also develop model technology transfer agreements and build on the WIPO-World Economic Forum model for attorneys to provide pro bono licensing for the least developed countries;

(b) Develop the expertise to advise and guide both technology owners and the least developed countries. Over time, higher levels of sophistication will be warranted, and the bank should develop appropriate strategies and activities under the authorization of its governing mechanism.

65. The Panel argued, as stressed above, that the effective engagement of the private sector would be vital to the success of the intellectual property bank in particular and the technology bank in general. To that end, consideration should be given to establishing a programme to focus private sector involvement in the least developed countries.

66. The Panel also proposed that the intellectual property bank establish a dialogue with countries with a high potential for growth to signify the opportunities that the least developed countries presented as new markets for investment, collaboration and innovation. Science, technology and innovation and opportunities to create win-win projects would be at the centre of the dialogue process. It is increasingly recognized that the least developed countries represent the final frontier for untapped growth on the planet (from frontier markets to emerging markets) and that this type of activity will help the least developed countries to realize their potential, which will be beneficial not only to them, but also to the rest of the world.

67. The Panel considered the governance arrangements of the following United Nations entities that have multi-stakeholder governance arrangements: United Nations University (UNU), the United Nations Global Compact and Sustainable Energy for All.

68. On the basis of the governance arrangements of those three entities, the Panel recommended that the governance and reporting aspects of the technology bank be modelled on those of UNU. It is noted that the detailed arrangements would need to be finalized during the operationalization phase of the bank, in consultation with the relevant departments of the United Nations.

69. The Panel recommended that, if modelled on UNU, the technology bank, to be headquartered in Turkey, consist of a governing council with 12 members, including a representative of the host country, as well as a representative of the Secretary-General as an ex officio member. The governing council would perform the following functions:

(a) Formulate principles and policies governing the activities and operations of the technology bank;

(b) Adopt statutes and recommendations necessary for the smooth and effective functioning of the bank;

(c) Consider and approve the work programme and adopt the budget of the bank on the basis of proposals submitted to it by the managing director;

(d) Consider reports of the managing director on the activities of the bank and the implementation of its plan of work;

(e) Report regularly to the General Assembly, through the Secretary-General, on the work of the bank;

(f) Create such subsidiary bodies as it deems necessary.

70. The Panel also recommended that the bank's staff consist of the managing director, professional and general service personnel, short-term staff and consultants and trainees. As with arrangements at UNU, the managing director and the internationally recruited staff would be covered by the provisions of the Staff Regulations of the United Nations and Staff Rules. The managing director,

appointed by the Secretary-General, would be responsible to the governing council for the direction, administration, programming and coordination of the bank.

71. The Panel also recommended that two regional centres of the bank be established, in accordance with General Assembly resolution 68/224, with the concurrence of the governing council.

72. The Panel observed that the main considerations for the staffing arrangements and the cost estimates for the first biennium (2016-2017) were to maximize the efficiency of programme delivery and establish a good foundation for the future on the basis of the continual evaluation of the bank's work. Considering the dynamic nature of technology and the diverse needs of the least developed countries, a prudent balance should be struck between core staff and personnel on short-term contracts who possess specific knowledge and expertise. Among the core staff, the emphasis should be on programme delivery rather than management overhead. The bank should also use the best available technologies in its programme development and delivery.

73. For the initial phase, the Panel recommended 27 Professional staff members and 9 General Service staff members, which would cost $8,566,530 for the first biennium (2016-2017). The Panel also recommended the amount of $7,090,000 for non-staff costs for the same cycle. Estimated staff and non-staff costs, along with the programme support costs at the rate of 13 per cent of total costs, would total $17,691,879 for the first biennium.

74. The Panel provided estimates of staff and non-staff costs, exclusive of the provision of physical infrastructure and the servicing thereof, which are expected to be taken up in the context of the host country agreement. Those estimates were provided to convey to the members of the Panel an order of magnitude regarding the size of the financial resources necessary to carry out the activities presented in the feasibility study during the initial biennium. The actual budgetary exercise will need to be carried out in the context of the operationalization of the technology bank, in consultation with the relevant departments of the United Nations.

75. The Panel proposed that the capital costs and recurrent costs of the technology bank be met through voluntary contributions, or the income derived therefrom, made by Member States, United Nations system organizations and other international organizations and by non-governmental sources, including foundations, the private sector, universities, non-governmental organizations, venture capital and individuals. In addition, in-kind contributions and partnerships would be sought to complement voluntary financial resources.

76. The Panel recommended that financial arrangements be in line with those of UNU as follows:

(a) The funds of the technology bank would be kept in a special account to be established by the Secretary-General in accordance with the Financial Regulations and Rules of the United Nations. The Secretary-General would perform all necessary financial and accounting functions for the bank, including retaining custody of its funds, and would prepare and certify the annual accounts showing the status of the bank's special account;

(b) The Financial Regulations and Rules would apply to the financial operations of the bank. Funds administered by and for the bank would, as provided in the regulations, be subject to audit by the Board of Auditors;

(c) The managing director would prepare the budget estimates for the bank in a manner consistent with United Nations regulations, rules, policies and procedures. The estimates, together with the comments and recommendations of the Advisory Committee on Administrative and Budgetary Questions thereon, would be submitted to the council for approval;

(d) The general administrative, personnel and financial services of the United Nations would be used by the bank on conditions determined in consultation between the Secretary-General and the managing director, it being understood that no extra cost to the regular budget of the United Nations would be incurred.

77. The Panel recommended that the status and authority of the technology bank be finalized in consultation with relevant parts of the Secretariat. The Panel also recommended that, similarly to UNU, the bank be designated as an autonomous organ of the General Assembly and enjoy the status, privileges and immunities provided for in Articles 104 and 105 of the Charter of the United Nations and in other international agreements and resolutions relating to the status, privileges and immunities of the Organization. The bank could acquire and dispose of real and personal property, take legal actions necessary to the performance of its functions and enter into agreements, contracts or arrangements with Governments, organizations, institutions, firms or individuals for the purpose of carrying out its activities. Persons travelling on the official business of the bank could, upon request, be provided with appropriate United Nations travel documents.

IV. Recommendations of the Panel

78. In its study, the Panel argued that the technology bank was feasible. The thinking behind it has been sound, and, on the basis of an analysis of the study, it appears that it could be launched on a firm foundation. With the offer of the Government of Turkey to host the bank, the initiative has made a very auspicious start.

79. The Panel determined that the technology bank, as a dedicated, coordinated and interlinked facility, could achieve quick gains during its initial phase of operation. Improved prospects for an increase in ODA to the least developed countries, as reflected in the outcome of the third International Conference on Financing for Development, coupled with the opportunity provided by the establishment of the technology bank to channel more ODA to the least developed countries in the areas of science, technology and innovation, also augur well for the funding prospects of the bank. As noted above, the bank would be based on voluntary resources and would use both in-kind and financial support provided by Member States and other stakeholders.

80. The Panel envisaged that the technology bank would leverage existing initiatives and grow incrementally, building on the experience gained and lessons learned from its work. In designing and delivering its programmes, the bank would accord primary importance to country ownership. Support provided to each least

developed country would, therefore, be primarily country-driven, reflecting each country's priorities and aspirations.

81. The Panel recommended that the bank, in collaboration with the Office of the High Representative, strive to ensure full coordination with the United Nations system by making use of existing coordination mechanisms at different levels. Such an approach would engender synergy, avoid duplication, strengthen the impact of the bank and facilitate the leveraging of ongoing and planned initiatives by United Nations system organizations in areas relevant to the work of the bank. The bank would also partner with Member States, the private sector, philanthropic foundations and civil society in implementing its activities.

82. In the light of the analysis presented above, the Panel considers the technology bank to be feasible and recommends its operationalization during the seventieth session of the General Assembly. Given that the comprehensive midterm review of the Istanbul Programme of Action will be held in Antalya, Turkey, in June 2016, it will be desirable to formally operationalize the bank during that important event, signalling the realization of a key initiative that emerged from the Conference. To that end, the Panel has requested the Secretary-General to undertake the following:

(a) Take the necessary steps to launch and operationalize the technology bank, including preparing a host country agreement, and inform the General Assembly accordingly;

(b) Establish a trust fund with the necessary flexibility to attract voluntary funding from Member States and other stakeholders, including the private sector and foundations;

(c) Mobilize organizations of the United Nations system and other international and regional organizations to support the launching and operationalization of the bank and its effective functioning;

(d) Encourage the principal stakeholders to extend generous support to the bank during its initial phase and beyond.

V. Conclusion

83. In line with the recommendations of the Panel, the Secretary-General is of the view that the timely establishment of the technology bank for the least developed countries as a critical instrument for creating a strong and viable science, technology and innovation base in those countries and for integrating science and technology into all spheres of their activities could assist in eradicating widespread poverty, removing daunting structural constraints and unleashing structural transformation, sustained growth and sustainable development, while protecting the planet.

84. The 2030 Agenda for Sustainable Development and the Addis Ababa Action Agenda of the third International Conference on Financing for Development both incorporate a recognition of the relevance of and the need for the technology bank. The 2030 Agenda sets an ambitious target to fully operationalize the technology bank and science, technology and innovation capacity-building mechanism for least developed countries by 2017. That deadline provides a strong impetus to conclude the work relating to the establishment of the bank in a timely manner.

85. The Secretary-General welcomes the offer of the Government of Turkey to host the technology bank for the least developed countries.

86. The Office of the High Representative will continue to provide substantive support and to assist the coordination of the United Nations system entities for the operationalization of the technology bank.